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ABSTRACT

The effects of (1) format and color, and (2) severity of issue (freeze damage to citrus industry) on response rate of mail questionnaires is presented. Questionnaires were formatted in two different ways: a one page, legal size printed on both sides, and one sheet 11- by 17-inch size center-folded with items on three pages. Two colors were used: white and buff. These combinations resulted in four different format/color combinations which were randomly mailed to 2,322 citrus producers and grove managers. The Chi-square test for homogeneity of proportions was used to treat the data concerning format and colors. Correlation was used to determine if response rate was influenced by severity of freeze damage. A response rate of 61 percent was obtained. There was no significant overall effect of format and color of mail questionnaires on response rate. There was a significant (.05) relationship between severity of freeze damage and rate of response--the more severe the freeze, the greater the response rate. These findings support the reviewed literature concerning the effects of format and indicating an association between rate of response and degree of interest in topic. (Author/PN)

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EFFECTS OF COLOR, FORMAT, AND SEVERITY OF ISSUE ON RESPONSE RATE OF MAIL QUESTIONNAIRES WHEN RESPONDENT POPULATION HAS SOME FAMILIARITY WITH SENDER

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FLORIDA

Effects of Color, Format, and Severity of Issue on Response Rate of Mail Questionnaires when Respondent Population has Some Familiarity with Sender. C. L. Taylor and W. R. Summerhill, Extension Program Development/Evaluation Specialists, University of Florida, Gainesville, Florida, 1985.

PURPOSE: The purpose of this study was to test the effects of (1) format and color, and (2) severity of issue (freeze damage to citrus industry) on response rate of mail questionnaires.

METHOD: Questionnaires were formatted two different ways, (1) a one page, legal size printed on front and back, and (2) a one sheet 11 x 17 center folded with items on three pages. Two colors were used, white and buff. These combinations resulted in four different format/color combinations: (1) single page, white, (2) single page, buff, (3) center fold, white, and (4) center fold, buff.

Questionnaires were mailed to 2,322 citrus producers and grove managers. Each name was randomly assigned to one of four groups.

The Chi-square test for homogeneity of proportions was used to treat the data concerning format and colors. Correlation was used to determine if response rate was influenced by severity of freeze damage.

FINDINGS: A response rate of 61 percent was obtained. There was no significant overall effect (test of no difference in proportions $x^2_3 = 0.580$; $P = 0.90$) of format and color of mail questionnaires on response rate. There was a significant (.05) relationship between severity of freeze damage and rate of response, the more severe the freeze, the greater the response rate. Acreage killed ranged from 93 percent in Putnam county to 20 percent in Brevard county.

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Effects of Color, Format, and Severity of Issue on Response Rate of Mail Questionnaires When Respondent Population Has Some Familiarity With Sender

Introduction

This paper reports on a study done to test the effects of (1) format and color, and (2) "severity of issue" (freeze damage to citrus industry) on response rate to a mail questionnaire. The questionnaire was mailed to a population of 2,322 citrus grove owners and grove managers in an eleven county area in central Florida (from Tampa on the Gulf Coast to Cape Canaveral on the Atlantic Coast and approximately 100 miles north). The purpose of the survey was to assess damage resulting from a severe freeze in January of 1985.

Basically the target population could be expected to have at least some familiarity with Extension, as they were all recipients of periodic mailings of literature, meeting notices, etc. Many worked very closely with Extension staff. In essence, all could be considered "Extension clientele."

Review of Literature

Questionnaire designers expend considerable thought and resources on constructing and implementing mail questionnaires in such a way as to maximize response rate. This is because validity of data is seen to be dependent upon a high rate of response. The literature is quite extensive on mail questionnaire response bias. Erdos (1970) has stated that the best way to reduce bias is to reduce the percentage of nonresponse to the lowest possible level.

Format and Color

A number of factors have been prcposed as having a bearing on rate of response. Two of them are format and color. The literature is somewhat contradictory concerning the effects of format on response rate. Rucker (1984) found that personalized cover letters and personalized follow-up letters actually reduced response rate. Personalized in this case means that the researcher's picture was on the letters. These findings are inconsistent with those of Phillips (1951) and Roeher (1963). Both found that personalizing devices improved response rate. Works by Hesselding and Smith (1977) revealed no difference in response rate between computer-prepared and offset-printed questionnaires. The method of printing, in this case, did not influence rate of response. Moss (1981) found there was a significant difference ($x^2 = 7.879$, $P < 0.25$) in response rate of questionnaires that were typeset stapled, photocopied, and typeset folded. Two studies compared response to matrix questionnaires with those to standard questionnaires (Rucker and Arbough, 1979). The matrix format produced significantly fewer returns. A second study comparing matrix and standard questionnaires of equal sizes found similar response rates but more incomplete returns for the matrix form.

In a study to determine the attitudes of 1,200 teachers toward tests, Tollefson (1984) used two format sizes. One was half as large as the other (conventional) size. She found that a significantly lower return rate occurred for the larger format size. Leitner (1979) conducted a study using four different questionnaire formats, (1) open-ended, (2) Likert-type, (3) checklist, and (4) rank ordering of five to eight factors. The check list had the highest response rate and rank ordering the lowest.

There appears to have been little work done concerning color and its influence on response rate. A recent search in the ERIC files revealed there were no citations on color of cover letters or questionnaires and its effect on response rate. However, an

earlier study (Gullahorn's, 1963) found that questionnaire color did not affect response rate.

Severity of Issue

The freeze in January of 1985 destroyed approximately 50 percent of the citrus acres in the eleven county area, with tremendous economic loss. Freeze damage is a concern that is common to all people associated with the citrus industry in the eleven county area and is of major concern to those severely affected. The thousands of acres of dead trees on the landscape have a high degree of visibility, thus heightening the overall awareness of the severity of the damage caused by the freeze. The northern most counties of those surveyed were more severely damaged than those in the southern part of the area. Some of the literature (Erodos 1957, Lansdowne 1970, Lawson 1949) suggests that respondent interest in a topic is a factor that influences rate of return. It would seem logical that those in counties most severely affected by the freeze would likely have the greatest degree of concern, and would have a greater propensity to respond to the survey.

Speed of Return

This study did not attempt to determine the effects of any factors on speed of return, only to describe it. The literature suggests that various factors may influence speed of return. Nichols and Meyer (1966) and Brown (1965) report the effects of the use of postcards on response speed. Works by Dillman and Fry (1974) and Cox (1974) indicates that personalization increases response speed. Moss (1981) reports that questionnaire format had a significant effect on response speed.

Method

For this study, questionnaires were formated two different ways, (1) a one page, legal size printed on front and back and (2) a one-sheet 11" x 17" center-folded with items on three pages. Two colors were used, white and buff. These combinations resulted in four different format/color combinations: (1) single page, white, (2) single page, buff, (3) center fold, white, and (4) center-fold, buff.

County Extension agents maintain citrus mailing lists, and after purging those lists for incorrect addresses 2,322 names were identified. Each name was randomly assigned to one of four groups. There were 576 assigned to group one, 578 assigned to group two, 588 assigned to group three, and 580 to group four. Group one received the single page white questionnaire, group two received the single page buff questionnaire, group three received the center-folded, white questionnaire, and group four received the center-folded buff questionnaire.

Color of the cover letters matched the color of the questionnaires. A reminder card followed three days after the initial mailing of the questionnaire. The second questionnaire was mailed 10 days after the initial mailing with a final reminder card mailed to nonrespondents 10 days after the second mailing. All correspondence to the respondents was signed by the local Extension agent.

The Chi-square test for homogeneity of proportions (Fleiss, 1981) was used to treat the data concerning format and color. Correlation was used to determine if response rate was influenced by serverity of freeze damage.

Results

Format and Color

Out of the 2,322 questionnaires mailed a total of 1,424 were returned, an overall response rate of 61 percent. The following table provides some insight about response rate based on color and format of the questionnaires.

Table 1: Grove owners and/or Managers Response rate to Mail Questionnaires Based on Format and Color, by Number and Percent, Florida, 1985.

Format and Color	Mailed	Response	
	No.	No.	%
Single page, white	576	363	63
Single page, buff	578	345	60
Center fold, white	588	364	62
Center fold, buff	580	352	61

Test of no differences in proportion $x_3^2 = 0.580$ ($p = 0.90$)

Table 1 indicates the percent returned ranged from 60 for the group receiving the single page buff questionnaire to 63 for the group who received the single page white quesitonnaire. There was no significant overall effect (no difference in proportions) of format and color of mail questionnaires on response rate. Twenty-seven percent of the quesitonnaires were returned for the first mailing. Thirty-four percent were returned for the second mailing of the questionnaire.

This study also attempted to determine if format and color influenced response rate with regard to the first mailing of the questionnaire. All the returns for the first 12 working days following the first mailing are considered the results of the first mailing. The second mailing was made 10 working days* after the first one. It is assumed the second mailing did not influence return rate for two days after its mailing.

* For purposes of this study, Saturday and Sunday were not considered working days.

Table 2 provides some insight into how format and color effected response rate of the first mailing.

Table 2: Grove Owners and/or Managers Response Rate to the First Mailing based on Format and Color by Number and Percent, Florida, 1985.

Format and Color	Mailed	Response	
	No.	No.	%
Single page, white	576	159	28
Single page, buff	578	167	29
Center fold, white	588	159	27
Center fold, buff	580	146	25

Test of no differences in proportion $x_3^2 = 1.451$ ($p = 0.75$)

Based on data in Table 2 there was no significant effect (no difference in proportions) of format and color on the response rate of the first mailing of the questionnaire. The percent return ranged from 25 for the group who received the center fold buff questionnaire to 29 for the group who received the single page buff questionnaire.

Severity of Freeze Damage

Respondents reported that 176,482 acres of citrus trees were killed by the freeze in January of 1985. Table 3 shows the percent of acreage killed in each county and the percent of questionnaires returned.

Table 3 Percent of Citrus Acreage Killed and Percent of Grove Owners/Managers Responding to a Mail Questionnaire, Florida, 1985.

% of Acreage Killed, by County		Percent Questionnaires Returned
Putnam	93	66
Hernando	82	82
Marion	75	73
Pasco	66	62
Volusia	59	78
Lake/Orange	56	60
Sumter	56	67
Seminole	27	64
Osceola	21	45
Brevard	20	54

$r = 0.6999$ $(p = 0.05)$

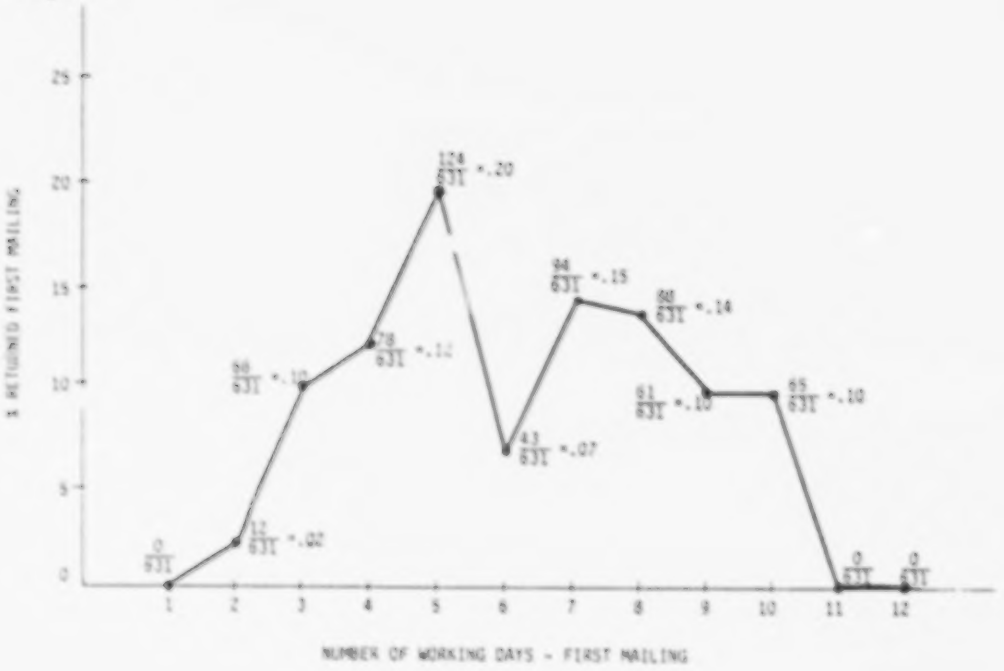
The amount of acreage killed ranged from 93 percent in Putnam county to 20 percent in Brevard County. Response rate ranged from a high of 82 percent for Hernando county to a low of 45 percent for Osceola county. As shown in table 3 there is a significance (0.05 level) relationship between severity of freeze damage and rate of response, the more severe the freeze the greater the response rate.

Speed of Response

Twenty-seven percent (631) of the population (2,322) responded within 12 working days after the first mailing. Figure 1 profiles the return rate.

Figure 1: Speed of Return of Mail Questionnaires by Percent and Number of Working Days for the First of Two Mailings, Florida, 1985.

Figure 1



In Figure 1, day 1 is the day the questionnaires were mailed. Twelve questionnaires were returned on day 2, 66 on day 3, 78 on day 4, and 124 on day 5, and 43 on day 6. Fifty-one percent of those returned from the first mailing were received by the end of the 6th day after mailing. The second mailing was made 10 day after the initial mailing. Figure 2 shows that 567 questionnaires were returned during the first 12 working days after mailing. Sixteen hundred ninety-one were in the second mailing (2,322 first mailing - 631 returned, left 1,691 for the second mailing). Fifty- one percent of the responses had been received by the end of the sixth working day (44 + 82 + 158 = 284 ÷ 567 = 51).

Figure 2: Speed of Return of Mail Questionnaires by Percent and Number of Working Days for the Second Mailing of Two Mailings, Florida, 1985.

Figure 2

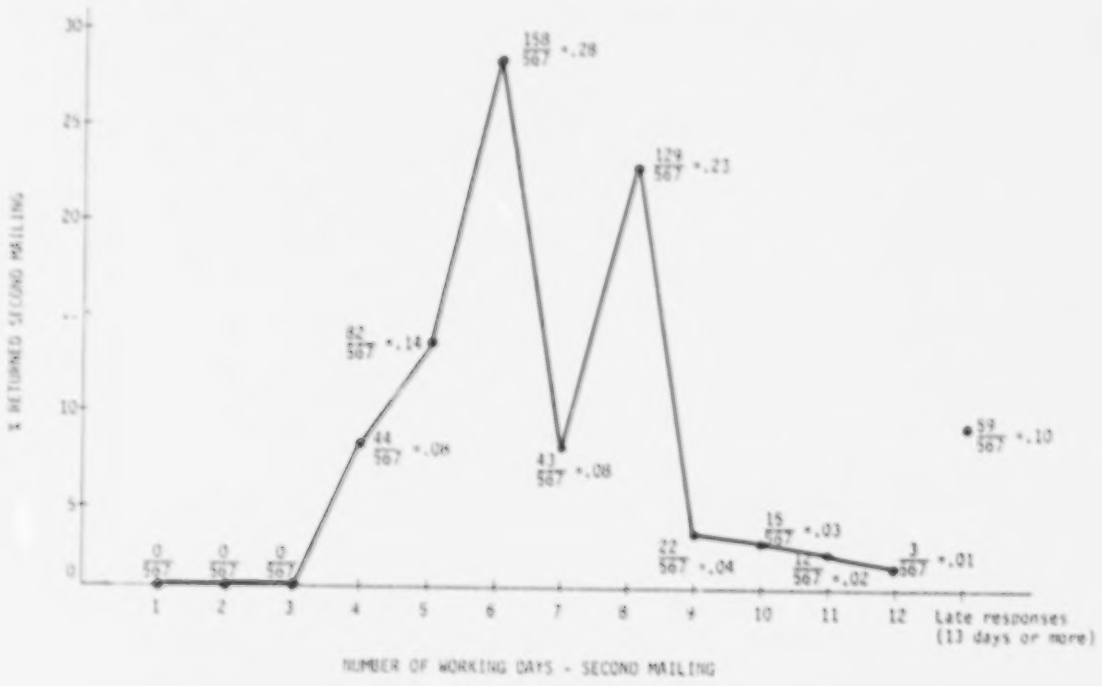


Figure 2 also reveals that 59 questionnaires were returned 13 days or more after the second mailing.

Summary/Conclusion

Format and color did not affect response rate, at least with a population potentially having a degree of familiarity with the sender. These findings support some of the studies reported in the literature concerning the effects of format.

This study revealed that rate of response was significantly correlated with severity of freeze damage. This would appear to support the literature indicating an association between rate of response and degree of interest in topic.

The technician failed to stamp the return date on 159 questionnaires. They were not included in the study concerning speed of return.

This study revealed that about half of the quesitonnaires were returned as a result of the first mailing and the other half the result of the second mailing. Half of the responses for each mailing had been received by the end of the sixth working day after they were mailed.

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